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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,001

04/17/2004

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51896

7590

12/05/2006

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EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT

PAPER NUMBER

1751

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/826,001

Applicant(s)

ROKHVARGER ET AL.

Examiner

Kallambella Vijayakumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

- The preliminary amendment to the Abstract filed 02/13/2005 has been entered.
- Claims 1-12 are currently pending with the application.
- The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Claim Objections***

Claim 4 objected to because of the following informalities: The claim misspells the word "then" as "than". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-2, 4-5 and 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said crystals" in Line-14, "said crystal grains" in Line-16 and "said additional phases" and "said further phase elements" in Line-18, and "said nano-size superconductor ceramic grains" in Line-19. There is insufficient antecedent basis for these limitations in the claim. Further, it is not clear whether the limitations listed in Part-A of the composition claims are part of nanostructure in Part (B). It is suggested to make the phase composition to be an integral part of the nanostructure by deleting (A) and (B) and deleting abridging "and" between (A) and (B) and replacing it with "wherein" and

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further deleting the word "and" in Line-13 and replacing with "of the said physical-chemical phase composition" to overcome the rejection.

Claim 2 recites the limitation "the raw ceramic powder" in Line-6. There is insufficient antecedent basis for this limitation in the claim.

Claims 4 and 5 recite the limitation "said element" in Line-6 and Line-5 respectively. There is insufficient antecedent basis for this limitation in the claims. The claims recite the limitation of "a sintered surface element" and "a three-dimensional structural element" respectively, while claim-1 recites the limitation of a "basic phase element", an "additional phase element" and "further phase element", and it is not clear what elements are included by this limitation of "element" in the claims. It is suggested to distinguish the specific elements in the claims from those in the independent claim.

The terms "long-length structure", "a large-size structure" and "a small-size structure" in claim 5 are relative terms, which renders the claim indefinite. The terms "long-length structure", "a large-size structure" and "a small-size structure" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. It is suggested to either delete these structures or replace with corresponding definite structures to overcome this rejection.

Claims 10 and 11 recite the limitation "said substrate" in Line-2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to include a substrate in the claim-1 to overcome this rejection.

Claim 12 recites the limitation "the silicone additive" in Line-2 "said crystals" in Line-16, "said crystal grains" in Line-18 and "said additional phases" and "said further phase elements" in Line-20, and "said nano-size superconductor ceramic grains" in Line-21. There is insufficient antecedent basis for these limitations in the claim. Further, it is not clear whether the limitations listed in Part-A of the composition claims are part of structure in Part (B). It is suggested to delete the word "the" and replace with "a" in Line-2. It is further suggested to make the phase composition to be an integral part of the nano-structure by deleting (A) and (B) and deleting abridging "and" between (A) and (B) and replacing

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with "wherein" and further deleting the word "and" in Line-13 and replacing with "of the said physical-chemical phase composition" to overcome the rejection.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-3, 5-9, and 12 are rejected under 35 U.S.C. 102(b) as anticipated by Topchiashvili et al (US 6,010,983) in view of Takahashi et al (US 2005/027543 or WO 03/102091) and Holloway (US 5,529,981).

In the absence of a definition of a nano-size, nano-particle, nano-domain by the applicants, the examiner construes the term to encompass a size of 1-1000 nm commonly taught in the nanotechnology art (See. Philips et al, US 6,755,886; Cl-2, Ln 21-25; or Domb et al US 5,578,325, Cl-10, Ln 24-43).

Normally, only one reference should be used in making a rejection under 35 U.S.C. 102. However, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra references are cited to (MPEP 2131.01)::

- (A) Prove the primary reference contains an "enabled disclosure;"
- (B) Explain the meaning of a term used in the primary reference; or
- (C) Show that a characteristic not disclosed in the reference is inherent.

Topchiashvili et al teaches a superconductor wire composition (3D-lead) containing an aligned/oriented superconductor oxide ceramic of YBCO made by coating a substrate with an emulsion containing the YBCO ceramic oxide particles, ultrafine Ag-particles (nano particles that reads on dope particle) and liquid-silicone polymer (silicate-precursor), magnetically orienting the YBCO ceramic particles, polymerizing the silicone around 250C and heat treating the composition between 800-950C. Topchiashvili et al further teaches the presence of a uniform dispersion of Ba<sub>2</sub>SiO<sub>4</sub> (silicate glass phase) and components such as SiC, Si, C and BaCO<sub>3</sub> (impurity and phases due to superconductor break down) in the wire composition (Abstract, Fig 2-3; CI-1, Ln 41 to CI-2, Ln 33; CI-3, Ln 1 to CI-4, Ln 23; CI-5, Ex-1).

Even though, Topchiashvili et al teach using an emulsion to coat the substrate, it does not explicitly disclose the particle size of the ceramic oxide, and it would be inherent for the composition to have a nano-size particle in the composition of Topchiashvili et al as recited in the claim in view of Takahashi et al (US 2005/0277543; Para 0040; WO 03/102091) that discloses a coating emulsion to contain ceramic oxide nano-particles (5-50 nm photo-catalytic oxide and 5-100 nm silica) dispersed in a hydrophobic resin (8-300 nm).

The prior art wire composition and its method of making the wire including components processed and the process parameters, and utility of the wire are identical to that taught by the applicants (Specification, Page- 13, Para-2-4; Pg-14, Ln 17-24, Pg-15, Para-2, 4) whereby the instant claimed nanophase, nano-size ceramic superconductor grains, nano-thick silicate glass and nano-distribution of impurities and dopants within nanophasic grain boundaries and the caging and framing of components forming nanocells will be inherent in the prior art composition, because identical compositions possess identical properties and characteristics.

The prior art teaches orientating the ceramic YBCO particles in a wire by applying a magnetic field and the instant claimed limitation of c-axis being perpendicular to the crystal grains aligned in a-b axis for the superconducting particles will be anticipated in the prior art composition in view of Holloway that clearly teaches attaining C-axis orientation by magnetic alignment of YBCO particles with improved

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current density (US 5,529,981, Abstract, CI-10, Lon 37–65), and it is the most preferred orientation for the superconducting oxide particles in superconducting wires/tapes.

With regard to claims 2 and 9, the prior art teaches, a composition containing 92.5 wt% YBCO, 5 wt% silicate elastomer and 2.5 wt% silver ultrafine powder (CI-5, Ex-1), wherein the composition, components used in making the wire and its processing conditions, and its utility are identical to that by the applicants, and identical compositions possess identical properties and characteristics.

With regard claims 3, 7, 8 and 10-11, the prior art teaches a wire whose composition and structure are identical to that by the applicant's and identical compositions possess identical properties and characteristics.

With regard to claim-6, the prior art teaches a wire.

With regard to the method in claim-12, the prior art teaches adhesive coating of the composition over the substrate, polymerizing the silicone around 250C and heat treating the composition between 800-950C, wherein the composition, components used in making the wire and its processing conditions, and its utility are identical to that claimed/taught by the applicants. All the limitations of the instant claims are met.

The reference is anticipatory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-3, 5-9, and 12 are rejected under 35 U.S.C. 103(a) as obvious over Topchiashvili et al (US 6,010,983) in view of Takahashi et al (WO 03/102091) and Holloway (US 5,529,981).

Topchiashvili et al teaches a superconductor wire composition <3D-lead> containing an aligned/oriented superconductor ceramic oxide of YBCO made by coating a substrate with an emulsion containing the ceramic YBCO particles, ultra-fine Ag-particles <nano particles that reads on dope particle> and liquid-silicone polymer <silicate precursor>, magnetically orienting the YBCO particles, polymerizing the silicone around 250C and heat treating the composition between 800-950C.

Topchiashvili et al further teaches the presence of a uniform dispersion of Ba<sub>2</sub>SiO<sub>4</sub> (silicate glass phase) and components such as SiC, Si, C and BaCO<sub>3</sub> (impurity and phases due to superconductor break down) in the wire composition (Abstract, Fig 2-3; CI-1, Lon 41 to CI-2, Lon 33; CI-3, Lon 1 to CI-4, Lon 23; CI-5, Ex-1).

The prior art is silent about the nanostructure of the composition per the claims 1 and 12, and the c-axis orientation of the ceramic crystals.

Even though, Topchiashvili et al teach using an emulsion to coat the substrate, it does not explicitly disclose the particle size of the ceramic oxide, and it would be obvious for the composition to have a nano-size particle in the composition of Topchiashvili et al as recited in the claim in view of Takahashi et al (US 2005/0277543; Para 0040 used as English Translation of WO 03/102091) that discloses a coating



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emulsion containing ceramic oxide nano-particles (5-50 nm photo-catalytic oxide and 5-100 nm silica) dispersed in a hydrophobic resin (8-300 nm) in the analogous art of oxide coating composition.

The prior art wire composition and its method of making the wire including components processed and the process parameters, and utility of the wire are similar to that taught by the applicants (Specification, Page-13, Para-2-4; Pg-14, Ln 17-24, Pg-15, Para-2, 4) whereby the instant claimed nanophase, nano-size ceramic superconductor grains, nano-thick silicate glass and nano-distribution of impurities and dopants within nanophasic grain boundaries and the caging and framing of components forming nanocells will be obvious in the prior art composition because similar compositions are expected to possess similar properties and characteristics.

Further it would be obvious to a person of ordinary skilled in the art to orient the superconductor oxide crystals in a C-axis to benefit from improved current density characteristics with a reasonable expectation of success, because such an orientation is well known in the art at the time of the disclosure of the invention by the applicants in view of Holloway that clearly teaches attaining C-axis orientation by magnetic alignment of YBCO particles with improved current density (US 5,529,981, Abstract, Cl-10, Ln 37-65), and it is the most preferred orientation for the superconducting oxide particles in superconducting wires/tapes.

With regard to claims 2 and 9, the prior art teaches, a composition containing 92.5 wt% YBCO, 5 wt% silicate elastomer and 2.5 wt% silver ultrafine powder (Cl-5, Ex-1), wherein the composition, components used in making the wire and its processing conditions, and its utility are similar to that by the applicants, and similar compositions are expected to possess similar properties and characteristics.

With regard claims 3, 7, 8 and 10-11, the prior art teaches a wire whose composition and structure are similar to that by the applicant's and similar compositions are expected to possess similar properties and characteristics.

With regard to claim-6, the prior art teaches a wire.

With regard to the method in claim-12, the prior art teaches adhesive coating of the composition over the substrate, polymerizing the silicone around 250C and heat treating the composition between 800-

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950C, wherein the composition, components used in making the wire and its processing conditions, and its utility are similar to that claimed by the applicants.

2. Claims 4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Topchiashvili et al (US 6,010,983) in view of Takahashi et al (WO 03/102091) and Holloway (US 5,529,981) further in view of Dorris et al (5,866,515).

The disclosure on the composition, structure and method of making a superconducting wire/coil by Topchiashvili et al as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art teaches making continuous conveyor production of wires of any length including 1-10 km long, but it is silent about the thickness of the wire per the claims or the thickness of the coating, although it teaches adhesive coating of an emulsion composition over silver/metal filament.

In the analogous art, Dorris et al teach making coated superconductor wires by coating a BSCCO/YBCO superconductor composition with a thickness of 19 micron over a nichrome wire with a diameter of 100 micron or a silver wire with a diameter of 125 micron (Cl-5, Ln 13-26; Cl-6, Ln 57-67; Cl-6, Ln 29-32).

It would be obvious to a person of ordinary skilled in the art to combine the prior art teachings to substitute the substrate in Topchiashvili with either a silver wire having a diameter of 125 micron or a nichrome wire with a diameter of 100 micron of Dorris as a functional equivalent, and optimize the coating thickness as a choice of design of coating operation with reasonable expectation of success, because Topchiashvili teaches using a metal substrate including silver, and the combined prior art teaching is suggestive of the claimed composition.

3. Claims 4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Topchiashvili et al (US 6,010,983) in view of Takahashi et al (WO 03/102091) and Holloway (US 5,529,981) further in view of Dorris et al (5,866,515).

The disclosure on the composition, structure and method of making a superconducting wire/coil by Topchiashvili et al as set forth in rejection-1 under 35 USC 103 (a) are herein incorporated.

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The prior art teaches making conveyor production of wires any length including 1-10 km, but is silent about the thickness of the wire per the claims or the thickness of the coating, although it teaches adhesive coating the composition over silver/metal filament.

In the analogous art, Dorris et al teach making coated superconductor wires by coating a BSCCO/YBCO superconductor composition with a thickness of 19 micron over a nichrome wire with a diameter of 100 micron or a silver wire with a diameter of 125 micron (CI-5, Ln 13-26; CI-6, Ln 57-67; CI-6, Ln 29-32).

It would be obvious to a person of ordinary skilled in the art to combine the prior art teachings to substitute the substrate in Topchiashvili with either a silver wire having a diameter of 125 micron or a nichrome wire with a diameter of 100 micron of Dorris as a functional equivalent, and optimize the coating thickness as a choice of design of coating operation with reasonable expectation of success, because Topchiashvili teaches using a metal substrate including silver, and the combined prior art teaching is suggestive of the claimed composition.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV  
November 21, 2006.

A handwritten signature in black ink, appearing to read 'K.M. Vijayakumar', with a long horizontal stroke extending to the right.

(K.M.Vijayakumar)  
Patent Examiner